Claims:

1. An antenna device having ultra wide bandwidth (UWB) characteristics, comprising:

a ground element having a cutout section with an inner circumference, the inner circumference having a first shape; and

a driven element with an outer circumference having a second shape, the driven element being smaller in size than the cutout section and being situated within the cutout section to define a clearance area between the driven element and the ground element;

wherein the first shape is a first simple closed curve having no cusps,

wherein the second shape is a second simple closed curve having no cusps, including at least a concave portion and a convex portion,

wherein the first and second shapes are formed such that any radial line from the center point of the driven element will intersect the first shape at a single first intersection point, and will intersect the second shape at a single second intersection point, a distance on the radial line between the first and second intersection points being defined as a clearance width between the driven element and the ground element for the radial line, and

wherein the clearance area is tapered such that a clearance width between the driven element and the ground element is monotonically nondecreasing from a minimum clearance width to a maximum clearance width.

2. An antenna device, as recited in claim 1, further comprising a transmission line for providing an electrical signal to the driven element.

3. An antenna device, as recited in claim 2, wherein the transmission line is connected to a driven element at a feed point proximate to the minimum clearance width of the clearance area.

4. An antenna device, as recited in claim 2, wherein the transmission line comprises a metal layer.

5. An antenna device, as recited in claim 2, wherein the transmission line comprises a magnet wire.

6. An antenna device, as recited in claim 2, wherein the transmission line comprises a coaxial cable.

7 An antenna device, as recited in claim 2, wherein the transmission line is not coplanar with either the driven element or the ground element.

8. An antenna device, as recited in claim 1, wherein the clearance area is filled with one of FR-4, Teflon, fiberglass, or air.

9. An antenna device, as recited in claim 1, wherein the ground element and the driven element comprise a conductive material.

10. An antenna device, as recited in claim 9, wherein the conductive material is copper.

11. An antenna device, as recited in claim 1, wherein the first and second shapes are the same, except in different scale.

12. An antenna device, as recited in claim 1, wherein the concave portion of the second shape is formed proximate to the maximum clearance width.

13. An antenna device, as recited in claim 1, wherein the driven element has an axis of symmetry about a line that passes between the minimum clearance width of the clearance area and the maximum clearance width of the clearance area.

14. An antenna device, as recited in claim 1, wherein the concave portion of the second shape is centered on the axis of symmetry, proximate to the maximum clearance width.

15. An antenna device having ultra wide bandwidth (UWB) characteristics, comprising:

a ground element having a cutout section with an inner circumference, the inner circumference having a first shape; and

a driven element with an outer circumference having a second shape, the driven element being smaller in size than the cutout section and being situated within the

cutout section to define a clearance area between the driven element and the ground element,

wherein the first shape is a first simple closed curve having no cusps, including at least a concave portion and a convex portion,

wherein the second shape is a second simple closed curve having no cusps, including at least a concave portion and a convex portion,

wherein the first and second shapes are formed such that any radial line from the center point of the driven element will intersect the first shape at a single first intersection point, and will intersect the second shape at a single second intersection point, a distance on the radial line between the first and second intersection points being defined as a clearance width between the driven element and the ground element for the radial line, and

wherein the clearance area is tapered such that a clearance width between the driven element and the ground element is monotonically nondecreasing from a minimum clearance width to a maximum clearance width.

16. An antenna device, as recited in claim 15, further comprising a transmission line for providing an electrical signal to the driven element.

17. An antenna device, as recited in claim 16, wherein the transmission line is connected to a driven element at a feed point proximate to the minimum clearance width of the clearance area.

18. An antenna device, as recited in claim 17, wherein the transmission line comprises a metal layer.

19. An antenna device, as recited in claim 17, wherein the transmission line comprises a magnet wire.

20. An antenna device, as recited in claim 17, wherein the transmission line comprises a coaxial cable.

21 An antenna device, as recited in claim 17, wherein the transmission line is not coplanar with either the driven element or the ground element.

22. An antenna device, as recited in claim 15, wherein the clearance area is filled with one of FR-4, Teflon, fiberglass, or air.

23. An antenna device, as recited in claim 15, wherein the ground element and the driven element comprise a conductive material.

24. An antenna device, as recited in claim 23, wherein the conductive material is copper.

25. An antenna device, as recited in claim 15, wherein the first and second shapes are the same, except in different scale.

26. An antenna device, as recited in claim 15, wherein the concave portion of the first shape is formed proximate to the maximum clearance width.

27. An antenna device, as recited in claim 15, wherein the driven element has an axis of symmetry about a line that passes between the minimum clearance width of the clearance area and the maximum clearance width of the clearance area.

28. An antenna device, as recited in claim 15, wherein the concave portion of the first shape is centered on the axis of symmetry, proximate to the maximum clearance width.